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AGRICULTURE

No. 151

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CHINA REPORT

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I. GENERAL INFORMATION

CORRELATION OF COLD TOLERANCE AT DIFFERENT GROWTH STAGES IN RICE

Beijing ZHIWU XUEBAO [ACTA BOTANICA SINICA] in English No 3, May 81 pp 203-207

[Article by Li Tai Gui [2621 1132 6311] (Chinese Academy of Agricultural Sciences), R. M. Visperas and B. S. Vergara (International Rice Research Institute)]

[Text]

Cold injury which influence rice production in different rice growing countries occurs at various growth stages. The degree of cold injury depends on the air or water temperature, the cropping pattern, the growth stage of the rice and other factors. It is generally accepted that cold tolerance of rice at one stage is different from another stage(6). However, Okabe and Toriyama(8) reported that varieties seem to respond similarly to cold temperature at different growth stages. Some varieties have been found to be tolerant at different growth stages(6).

The purpose of this experiment is to find whether cold tolerance scores at different growth stages of different kinds of rice are correlated or not.

MATERIALS AND METHODS

Several types of rice varieties from the International Rice Research Institute germplasm bank, consisting of indica, japonica, javanica and wild rices were used (Table 1). A total of 50 entries have been scored at 5 stages: Early seedling (ES), Seedling stage (SS), Transplanting (TS), Panicle Development (PD) and Flowering stage (FS).

The methods of screening used are as follows:

1. Early seedling stage: The seeds were soaked for one day and incubated for 3 days at room temperature. The seeds were then placed in the refrigerator at 3°C. After 10 days, they were removed from the refrigerator, and placed in the greenhouse where the seedlings were allowed to grow. The plants were scored 10 days later on the basis of seedling vigor.

2. Seedling stage: The method is the same as the one developed at IRRI(9).

3. Transplanting stage: 30 days after sowing the seedlings were transplanted in plastic trays with soil. They were subjected to cold water temperature (15°C) continuously for 10 days. Then they were grown under ordinary conditions for recovery. Scoring was done on the 8th day after cold treatment.

表1 供试的水稻品种及其在不同生长阶段对低温的反应

Table 1 List of rice varieties used and their reaction to low temperature at different growth stages*

No. Variety 品种	Type 类型	ES 芽期	SS 苗期	TS 移栽期	PD 孕穗期	FS$_1$ 开花期$_1$	FS$_2$ 开花期$_2$
1 C5481	indica	5	2	8	1	9	7
2 TIHoju	indica	9	5	1	5	5	9
3 Yan-shun 1	indica	9	5	7	9	7	9
4 RDR2	indica	7	5	6	9	5	9
5 PTB26	indica	9	5	5	5	7	9
6 ADT19	indica	9	5	5	9	7	5
7 575A1-26-4-6	indica	5	3	8	7	7	9
8 575A4-20-6	indica	3	2	7	7	9	5
9 BG695	indica	3	5	9	1	9	9
10 BG707	indica	7	6	8	—	9	9
11 BG708	indica	7	5	8	—	—	—
12 BO14	indica	9	9	9	9	9	9
13 BO16	indica	9	8	8	—	9	—
14 IR8	indica	7	9	8	9	9	5
15 T36	indica	9	6	7	9	9	5
16 Vary Lava 16	indica	3	3	6	5	9	1
17 3558	indica	9	5	9	7	5	9
18 DB1	indica	7	7	8	3	1	9
19 A6-10-49	indica	9	7	5	9	3	9
20 BW173	indica	9	7	7	9	9	9
21 Guneki	indica	9	5	8	7	7	9
22 Tainan-iku 500	indica	5	3	7	3	9	3
23 Chenlun 55	Sinica	1	3	6	9	7	9
24 Ming-huo-tsao-tao	Sinica	1	3	8	3	7	5
25 No-iku 1716	Sinica	9	4	8	3	9	9
26 Shin 2	Sinica	7	4	8	3	5	3
27 Norin 36	Sinica	9	4	7	9	7	9
28 Tachi-ki-kokoku-mochi	Sinica	7	3	9	9	7	5
29 Hukjo 97	Sinica	7	4	9	9	9	7
30 Taichu 65	Sinica	9	3	—	1	7	1
31 Vercelli	Sinica	5	5	6	9	5	3
32 Fujisaka 5	Sinica	5	4	5	3	5	3
33 Iratom 39	indica/sinica	9	7	6	7	7	9
34 Gendjah Beton 1101	javanica	7	5	7	—	9	5
35 Djalen 37	javanica	7	5	8	—	—	—
36 Ketan Gadjih 647	javanica	7	5	8	—	9	5
37 Leter	javanica	7	3	9	3	9	5
38 Gendjah Arak	javanica	5	9	9	3	9	3
39 Paray Dagul	javanica	5	3	8	9	9	5
40 Paraykalinuq	javanica	5	6	8	3	9	5
41 Qawqaway	javanica	9	5	6	7	9	5
42 Bantia	javanica	3	9	6	1	9	—
43 Boro 1	javanica	7	7	7	9	5	7
44 *O. glaberrima*, Kandiani	African cultivated rice	5	7	5	—	—	—

No. Variety 品种	Type 类型	ES 芽期	SS 苗期	TS 移栽期	PD 孕穗期	FS_1 开花期$_1$	FS_2 开花期$_2$
45 *O. glaberrima*, Koirao	African cultivated rice	7	5	6	—	—	—
46 *O. nivara*	wild rice	9	3	—	—	—	9
47 *O. barthii*	wild rice	9	6	—	1	9	9
48 *O. rufipogon*	wild rice	9	7	5	—	9	9
49 *O. spontanea*	wild rice	9	6	7	3	9	5
50 *O. rufipogon* x O. nivara	wild rice	9	6	8	9	9	9

* The scoring number is that: 1 very resistance, 3 resistance, 5 general, 7 susceptible, 9 very susceptible. 表中数字 1.抗性强 3.较强 5.一般 7.敏感 9.很敏感。

4. Panicle development: The plants were subjected to daynight temperatures of 29/15° C for 5 days(*) at panicle development stage.

5. Flowering stage: There were methods used: one is the use of cut panicle(*) and the other is using the whole flowering plant. The whole plant is placed inside the lighted room with 15/15°C for 3 days, and allowed to mature at 29/21°C. The percentage of sterility was calculated (FS_1).

RESULTS AND DISCUSSION

The tested varieties consisted of 18 indica varieties, 12 japonica, 10 javanica, 7 wild rice and 3 japonica x indica. Based on overall performance at different growth stages, the order of cold tolerance among different kinds of rice is as follows (Table 2):

Sinica (Japonica) > Javanica > Indica > Wild rice

At the early seedling stage and the seedling stage, sinica are definitely better than the other varietal types. At panicle development and flowering stage, however, the javanicas were better than the sinica in cold tolerance. Wild rices are generally the most susceptible to cold temperature. But some species like *O. barthii* and *O. spontanea* were very resistant to cold temperature at booting stage (Table 1).

Transplanting stage is a special stage in which the sinica are more susceptible compared to the wild rice. This shows that the wild rices have better booting ability at low temperature than other kind of rices.

The results clearly show varietal differences in cold tolerance not only on the basis of origin of the variety but also the stage of growth of the plant.

Table 3 shows the correlation matrix among the different stages at which screening was conducted. A significant correlation between early seedling stage and seedling stage and also early seedling stage with flowering stage. Positive correlation also existed between seedling stage and flowering stage (FS_1). There was no correlation between using the whole plant or the cut panicle in testing for cold tolerance at anthesis. Varieties like Vary Lava 16, DB1 and Taichu 65 showed opposite results when tested under these two conditions.

表2 不同类型的水稻品种在不同生长阶段的平均抗寒等级

Table 2 Average scores of different kinds of rice at different stages

Type 类型	Stages 阶段					Average 平均
	ES 芽期	SS 苗期	TS 移栽期	PD 孕穗期	FS, 开花期,	
Indica	7.3	5.3	7.0	6.3	7.6	6.7
Sinica	6.0	3.7	6.7	5.8	5.4	5.5
Javanica	6.4	6.3	7.6	5.0	5.0	6.1
Wild rice	9.0	5.6	–	–	9.0	7.8

表3 水稻不同生长阶段抗寒的相关性

Table 3 The correlation among different stage of rice

Stage 阶段	ES 芽期	SS 苗期	TS 移栽期	PD 孕穗期	FS, 开花期,	FS, 开花期,
ES 芽期		.439**	-.092ns	-.269ns	-.073ns	.372**
SS 苗期			-.004ns	.185ns	-.037ns	.328**
TS 移栽期				-.010ns	.326*	.043ns
PD 孕穗期					-.153ns	.297ns
FS, 开花期,						.180ns
FS, 开花期,						

* correlation at 5%. 5% 相关。

** significant correlation at 1%. 1% 显著相关。

ns-none of correlation. 不相关。

According to references, there are correlations between germination stage and seedling stage[4]; germination stage and filled grain stage, and maturing stage[3]; seedling stage and exsertion stage panicle development and exsertion stage[1] panicle development and flowering stage[1].

Although the number of varieties used in the present experiment is limited, it is apparent that varietal differences exist and some rice groups like the sinica are generally more tolerant than the others.

The generally low and lack of correlation between the low temperature reactions at different growth stages indicate that screening at one stage does not guarantee the selection of a variety or line tolerant at all stages. In selecting for donor parents, screening at different stages is necessary. In selecting for promising lines, screening may be conducted only on the stages, that are critical for the particular area that the line will be used.

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CSO: 4020/209

BRIEFS

HOG PURCHASES RECORD--Beijing, 17 Jun (XINHUA)--China purchased 47.6 million and sold 48.2 million hogs from 1 January to 31 May this year, both record figures according to the China National Foodstuffs Corporation. Ninety-five percent of the pigs were purchased from peasant families who now sell 2/3 of the porkers they raise. Four years ago they sold only 1/2 their production. Now hogs are 5.3 kilograms heavier on the average than in 1979. In 1980, per capita consumption of pork averaged 11.2 kilograms as against 7.4 kilograms in 1975. More than 200,000 tons of lard and 79.85 million hides were produced in 1980. State subsidies for pork processing and sales amounted to 1,700 million yuan. Since state purchasing prices for hogs were raised in 1979 an additional 3,000 million yuan has been earned annually by the peasants. [Text] [OW251151 Beijing XINHUA in English 1306 GMT 17 Jun 81 OW]

RAPESEED PURCHASING QUOTA--Beijing, 25 Jun (XINHUA)--Grain departments in China's 14 major summer rapeseed-producing provinces and Shanghai Municipality had purchased 1.74 million tons of the crop by June 20, 6.8 percent more than this year's quota and one million tons more than the same period last year, according to the CHINA FINANCE AND TRADE JOURNAL today. China's 1981 summer rapeseed output is estimated by agricultural departments to be 2.8 million tons. Since late May, rapeseed purchases have averaged 50,000 tons per day. [Text] [Beijing XINHUA in English 1259 GMT 25 Jun 81 OW]

COTTON PROCUREMENT--Beijing, 25 Jun (XINHUA)--Chinese peasants had sold to government purchasing agencies 2,651,500 tons of cotton by the end of April for the 1980-81 cotton purchasing year. They are expected to sell an additional 15,000 tons by August, the end of the 1980-81 cotton purchasing year. The All-China Federation of Supply and Marketing Cooperatives said today that the figure exceeds that of any previous year. The previous peak was the 1972-73 purchasing year, when peasants sold 2,379,000 tons of cotton. Quality of cotton purchased by the government is better than last purchasing year, according to the federation. Indicating this is the fact that 82.17 percent of the cotton already purchased is good enough for textiles, 8.91 percent higher than last year. The cotton-growers are expected to earn an additional 2,000 million yuan by selling cotton. [Text] [Beijing XINHUA in English 1301 GMT 25 Jun 81 OW]

PER CAPITA FOOD GRAIN--Beijing, June 27 (XINHUA)--China's average per-capita food grain rose to 324 kilograms last year, 115 kilograms more than the figure for 1949 when the People's Republic was founded, according to food-grain purchasing authorities. Over the same period, China's population has increased 81 percent. The amount of grain for sale increased and grain prices were stable last year, even dropping somewhat at peasants' free markets, although the country in 1980 harvested some 10 million tons of cereal less than in 1979. The cause was that average cereal crop yields were good nationwide in 1978 and 1979 in spite of adverse weather in certain regions and, with job responsibility systems being phased in for farm production, the peasants had more food grain at their own disposal after delivering grain as tax and selling surplus grain to the state following the harvests. [Text] [OW271350 Beijing XINHUA in English 1245 GMT 27 Jun 81]

COMMODITY GRAIN--At present China's agriculture is still, in the vast majority of places, a semi-natural economic agriculture. In fact, it is an agriculture in which the natural economy is in the commanding position, with the commodity economy being greatly underdeveloped. Even in the commercial agricultural product bases we now have, the degree of commercialization is not very high, and agriculture is still to a very great degree self-sufficient in nature. According to statistics, in 1978 commercial, foreign trade and grain departments throughout the nation purchased 46 billion yuan worth of agricultural products. This was only 31.5 percent of the gross agricultural output value for that year, which was 145.9 billion yuan. With respect to grain, in recent years approximately 75 percent of the grain produced by the peasants has been for their own consumption (this includes seeds, fodder and grain rations), while approximately 20 percent has been sold to the state and approximately 5 percent has been traded at country markets, so that only 25 percent of all grain is sold commercially. If we deduct what is sold back to rural areas, then only around 15 percent of the grain purchased by the state is for commercial purposes. [Excerpt from article by ZHU Daohua [2612 6670 5478]: "On the Commodity Economy in Chinese Agriculture"] [Beijing NONGYE JINGJI WENTI in Chinese No 4, 23 Apr 81 p 2] 9717

NATIONAL COTTON DISEASE--Beijing, 25 Jun (XINHUA)--The all-China research and coordination group for comprehensive prevention and treatment of cotton wilt recently proposed that the cotton-producing areas throughout the country immediately take effective measures to control the spread of the cotton disease. According to preliminary statistics, 8.58 million mu of cotton fields were infected by the disease in 1978. In 1981, the total infected acreage in 12 provinces has reached 11.52 million mu. The affected provinces are Jiangsu, Zhejiang, Hubei, Hunan, Sichuan, Anhui, Shandong, Shanxi, Hebei, Henan, Shaanxi and Liaoning. The effective measures are to set up a plant diseases checking system and to prevent bringing in infected cotton seeds. [Beijing XINHUA Domestic Service in Chinese 0107 GMT 25 Jun 81 OW]

HUANGHE ANTIFLOOD COMMAND CONFERENCE--From 2 to 5 June, the Huanghe River Antiflood Command held a conference in Zhengzhou Municipality on Huanghe River antiflood work in Shaanxi, Shanxi, Henan and Shandong provinces. The conference arranged this year's Huanghe River antiflood work. According to the statistical data collected over the past 240 years, the Huanghe River enters a high water period after a low water period for about 10 years. This year is the 12th year of the low water period. The Huanghe River is very likely to have a high water period and we must heighten our vigilance. We must make good preparations against floods. Under the leadership of party committees and governments at all levels, while combating drought, we must quickly establish antiflood organizations at all levels and put them on a sound basis. Wang Huayun, vice minister of the Ministry of Water Conservancy and chairman of the Huanghe River Committee, gave the summing-up report. Dai Suli, Henan provincial CCP committee secretary and acting governor, spoke. [HK221428 Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 6 Jun 81 HK]

CSO: 4007/471

BRIEFS

QINGYANG PREFECTURE SHEEP--Lanzhou, 22 Jun (XINHUA)--Qingyang Prefecture, Gansu, is raising more than 1.9 million sheep. In 1980 it procured more than 2.2 million jin of wool. [OW241515 Beijing XINHUA Domestic Service in Chinese 0050 GMT 22 Jun 81 OW]

CSO: 4007/471

GUANGDONG

BRIEFS

REVOLUTIONARY BASES CONFERENCE--From 25 to 30 May, the Guangdong Provincial People's Government held a conference in Puning County on work concerning the old revolutionary bases. The conference summed up and exchanged experiences on work concerning the old revolutionary bases, looked into how to speed up construction of the old revolutionary bases and strive to improve them in 3 to 5 years so that the 4 million people in the old revolutionary bases throughout the province will become rich as quickly as possible. Attending were Yin Linping, provincial CCP committee secretary and vice chairman of the provincial old revolutionary bases construction committee; and Fan Xixian, vice governor and vice chairman of the provincial old revolutionary bases construction committee. The old revolutionary bases are mostly mountainous areas and semimountainous areas which can be utilized. The province must take such measures as to develop agricultural and animal husbandry production, handicrafts and diversification. [HK230747 Guangzhou Guangdong Provincial Service in Mandarin 2330 GMT 6 Jun 81 HK]

FORESTRY MEETING--From 25 to 29 May, the Guangdong Provincial Forestry Department held an on-the-spot meeting in Dainbai County on developing forests to supply firewood and on building up coastal shelter belts. At the meeting, representatives from Daianbai, Chaoyang and Qingyuan counties introduced their experiences. The meeting formulated a plan on developing forests. The meeting pointed out that the province now has only some 2 million mu of forests which supply only 900 million jin of firewood every year. The meeting also pointed out that more than a half of the people in the province use firewood and the province consumes 2.8 billion jin of firewood every year. Thus, the forests in the province cannot presently meet the needs of people's livelihood. [Guangzhou Guangdong Provincial Service in Mandarin 1000 GMT 6 Jun 81 HK]

ZHONGSHAN COUNTY PEASANT ASSOCIATION--The Zhongshan County Peasants Association, Guangdong's first county peasants association, was founded yesterday. On the morning of 14 June, some 600 delegates to the Zhongshan County Peasants Association gathered together to celebrate the establishment of their own organization. The Zhongshan County Peasants Association was developed in the basis of the poor and lower-middle peasants' associations. Basic-level peasant associations were established one after another in Zhongshan County since the beginning of last April with the help of the provincial and prefectural work groups. By the end of last May, 95.8 percent of the prospective members in the county had joined peasants associations. All prefectures and some counties in Guangdong sent representatives to attend the inaugural meeting as observers. [Guangzhou Guangdong Provincial Service in Mandarin 1000 GMT 15 Jun 81 HK]

OVERSEAS CHINESE FARM--Guangzhou, 22 Jun (XINHUA)--The Guangming overseas Chinese farm in Guangdong Province has made effective use of foreign capital in developing milk production. It now daily sells about 12 dun of fresh milk to Hong Kong, accounting for more than 50 percent of milk sold to Hong Kong. Located 60 kilometers from Shenzhen Municipality, the farm has some 70,000 mu of land and more than 5,000 workers and staff, of which 40 percent are returned overseas Chinese. In March 1979 the Hong Kong Bean Products Company loaned the farm HK$26 million which the farm used to import more than 1,200 fine-strain cows from New Zealand and milking equipment from Sweden and build a modernized milk processing plant. The farm now has more than 3,000 cows and expects to have 5,000 by 1984 which will daily produce more than 20 dun of fresh milk. [Beijing XINHUA Domestic Service in Chinese 0108 GMT 22 Jun 81 OW]

CSO: 4007/471

HEBEI

GRAIN OUTPUT AND AGRICULTURE MODERNIZATION IN HEBEI

Beijing NONGYE JINGJI WENTI [PROBLEMS OF AGRICULTURAL ECONOMICS] in Chinese No 4, 23 Apr 81 pp 13-14

[Article by ZHANG Zhongwei [1728 0112 1218], Cai Wenyuan [5591 2429 6678] and Liu Delun [0491 1795 4858]: "Some Economic Problems in Agricultural Modernization in Tong County"]

[Excerpt] Table 1. Tong County, Hebei Province, Analytical Chart of the Relationship between Yearly Grain Output and the Agricultural "Four Modernizations"

Year Item	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total grain output (in millions of jin)	36,546	32,894	40,789	47,855	49,120	47,897	41,620	51,001	46,656
Per mu yield of land planted in grain (jin)	505	461	582	686	714	709	613	783	724
Heavy and medium tractors per 10,000 mu of cultivated land	3.4	4.2	5.0	5.7	5.7	6.2	7.3	8.9	10.4
Amount of fertilizer per mu of cultivated land (in jin)	71	117	139	154	200	225	190	239	218
Agriculturally used electricity per mu of cultivated land (in kilowatt hours)	30.4	34.9	33.3	44.6	59.3	72.2	69.3	85.8	92.2
Proportion of irrigated area to total cultivated area (in percentage)	46.2	52.8	61.1	66.7	71.8	77.2	81.1	94.4	95.3

Note: There was a bad drought in 1972, and 1977 and 1979 had cold springs.

(1) Relationship between Yearly Grain Production and the Agricultural "Four Modernizations"

From Table 1 we can see that: (1) The increase in per unit yield and total yield of grain from 1971 to 1979 was relatively fast, with the per unit increase in the 8 year period being 40 percent, and the increase in total yield being 30 percent. (2) The increase in grain production was closely related to improvements in the level of the "Four Modernizations" of agriculture, and the increase in the level of the "Four Modernizations" of agriculture had a tremendous stimulating effect on agricultural production. The reduction in grain yield in 1972 was primarily due to the drought, and reduced grain yields in 1977 and 1979 were not only influenced by cold springs, as reductions in chemical fertilizer also played a role. The increase in the per unit yield and in the total yield of grain did not match the level of development of the "Four Modernizations." The number of large and medium-sized tractors was 200 percent greater in 1979 than in 1971, chemical fertilizer also increased 200 percent, electricity for agricultural use increased 202 percent and the area under irrigation grew 99 percent. Naturally, we cannot say that a certain increase in the agricultural "Four Modernizations" will be matched by the same increase in grains. However, if attention is paid to the economic analysis of investment results, and we see to it that the various measures to increase yields are coordinated in a rational manner, it is possible to achieve good results through small investments.

(2) Analysis of the Economic Results of the Agricultural "Four Modernizations"

Table 2. Tong County, Hebei Province, Analysis of the Economic Effects of the Agricultural "Four Modernizations"

Year Item	1970	1975	1979
Increase in agricultural income taking 1970 as 100	100	149	136
Increase in agricultural expenses, taking 1970 as 100	100	194	208
Proportion of agricultural income taken up by agricultural expenses (in percentage)	33.6	47.2	51.5
Amount recovered per yuan of agricultural expenditures (in yuan)	2.97	2.12	1.94
Cost per jin of grain production	0.055	0.076	0.086
Production cost per mu of cultivated land (in yuan)	26.17	54.30	80.41

Note: The reduction in total agricultural income in 1979 was primarily the result of reduced yields of grain caused by cold temperatures, while cotton production was affected by heavy cutbacks in planted area.

As can be seen clearly in Table 2, the economic results of the agricultural "Four Modernizations" shows a declining trend. The rate of increase in agricultural costs greatly exceeds the rate of increase in agricultural income. Agricultural expenditures were 108 percent greater in 1979 than in 1970, while agricultural income only grew 36 percent. The proportion of agricultural income taken up by agricultural expenditures grew from 33.6 percent in 1970 to 51.5 percent in 1979. The increase in agricultural expenditures was primarily due to sharp increases in the cost of chemical fertilizer, mechanized operations and hydroelectric power. Taking 1971 as 100 percent, by 1979 the cost of chemical fertilizer had grown to 200 percent, the cost of mechanized operations had increased to 230 percent and the cost of hydroelectric power had increased to 202 percent. In 1970 each yuan of agricultural expenditures brought in 2.97 yuan, which had declined to 1.94 yuan in 1979. The average per jin production cost of grain throughout the county rose from 0.055 yuan in 1970 to 0.086 yuan in 1979. According to a survey by the Finance and Tax Bureau of Tong County, the lowest production cost per jin of grain by any production brigade in 1979 was 0.038 yuan, while the highest of any production brigade was 0.161 yuan. Production expenditures per mu of cultivated land grew from 26.17 yuan in 1970 to 80.41 yuan in 1979.

Because of the tremendous increase in agricultural production expenditures, the increase in income of commune members has not been very fast. The average income of a commune member was 80.20 yuan in 1970 and 86.61 yuan in 1977, so that there was only a 6.41 yuan increase over the 7 year period, and the average yearly increase was less than 1 yuan. Only in the last two years, with the implementation of the spirit of the Third Plenum of the Central Committee and with the implementation of the Party's various policies for rural areas, has there been an increase in the price of agricultural and animal husbandry products and a distribution of some of the income from commune and brigade enterprises which, accompanied by a reduction in the savings rate, has finally resulted in a rather sizable increase in the income of commune members. In 1978 the average income of the commune member reached 108.6 yuan, and in 1979 this increased further to 123.3 yuan.

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CSO: 4007/432

BRIEFS

YI COUNTY AFFORESTATION--Yi County, Hebei Province, afforested 113,000 mu of land and harvested over 20 million jin of fruit in 1980. It has also overfulfilled its first quarter afforestation plan by 60 percent in 1981. [OW241453 Beijing Domestic Service in Mandarin 1000 GMT 21 Jun 81 OW]

CSO: 4007/471

BRIEFS

HAILSTORMS REPORTED--Eleven cities and counties in Hejiang Prefecture, Heilongjiang Province, were recently stricken by hailstorms. Field crops over more than 280,000 mu of farmland and almost 1,000 households were damaged to varying degrees. Following the calamity, with the assistance of departments concerned, the afflicted areas have successfully completed the tasks for replantation, double cropping and house repairs. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 18 Jun 81 SK]

CATTLE PRODUCTION--As of the end of March, Dorbod Mongol Autonomous County, Heilongjiang, had 38,515 head of cattle, an increase of 14.15 percent over the corresponding 1980 period. [SK071111 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 6 Jun 81 SK]

AFFORESTATION PROJECTS--Heilongjiang Province's Yichun forest covers 3.51 million hectares. It is one of China's important timber production bases. Since its development in 1948, the area has produced 143 million cubic meters of timber, afforested 900,000 hectares of lands and given to the state 1.7 billion yuan in profits--3.1 billion yuan including taxes paid to the state. The area has 105 forest farms and 256 industrial enterprises, including building material plants, furniture plants, paper mills and chemical plants. The 1.2 million people in this area have a per capita income of 651 yuan. [SK230913 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 22 Jun 81 SK]

CSO: 4007/471

BRIEFS

PROVINCIAL RAINFALL--On 7 and 8 June, it rained heavily in the greater part of Henan Province except for Xinyang Prefecture. It rained most heavily in Zhoukou and Zhumadian prefectures and the southern part of Xuchang Prefecture, with the rainfall average being 30 to 40 mm. These places must take this opportunity to carry out crash-sowing. Ten counties and municipalities in the province had rainfall of more than 40 mm, and their drought situation has been basically eliminated. Thirty-four counties and municipalities had a rainfall of 20 to 30 mm and their drought situation has lessened. Some 70 counties and municipalities had a rainfall of less than 20 mm, and some of them had only 7 mm. They must continue to combat drought. This rainfall is very beneficial to the early and late fall crops. [Zhengzhou Henan Provincial Service in Mandarin 1130 GMT 9 Jun 81 SK]--According to the report of the Henan provincial meteorological station issued on the afternoon of 10 June, since 7 June, it has rained heavily in the greater part of the province except for Sanmenxia Municipality, Jiyuan, Xinyang and Boai counties and Jiaozhuo Municipality. The rainfall has ranged from 20 to 90 mm in 63 counties and municipalities, from 10 to 20 mm in 25 counties and municipalities and from 5 to 10 mm in 9 counties and municipalities. This rainfall is very beneficial to the growth of the early fall crops and to the crash-sowing of late fall crops. [Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 11 Jun 81 HK]

GRAIN PRICES--Zhengzhou, 13 Jun (XINHUA)--Starting 1 May this year, the grain supply departments in Henan Province sold wheat in markets of 49 counties and municipalities at a price 1 to 1.5 cents cheaper per jin in an effort to stabilize the grain price. As of the end of May, the average price of wheat per jin was reduced from 36 cents to 32.8 cents. Henan is one of the main wheat producing areas in China and the province had a good harvest of wheat last year. The price increase of wheat arose from the rapid development of the food service industry in various municipalities and townships, and the procurement of wheat from agricultural trade markets for shipping to areas in neighboring provinces hit by natural disasters. [Beijing XINHUA Domestic Service in Chinese 0035 GMT 13 Jun 81 OW]

CSO: 4007/471

BRIEFS

ZHONGXIANG COUNTY EGG EXPORTS--By early June, Zhongxiang County, Hubei Province had supplied more than 1.18 million jin of eggs for export. This surpassed the record for last year's corresponding period by some 380,000 jin and was 284,000 jin more than the target set for this year. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 21 Jun 81 OW]

UNDERGROUND TUNNEL--Water in the Datong water reservoir in Qichun County, Hubei, flowed through a long underground tunnel to reach Guangji County for the first time on 11 June, thus greatly alleviating drought conditions in Guangji County. The underground tunnel is 3.5 meters in height, 4 meters in width and 6,004 meters in length. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 12 Jun 81 OW]

DROUGHT REPORTED--Some 8 million mu of cotton in Hubei has suffered from drought since late April. Rains have not fallen in most areas in the province for over 50 days. In early May, 51.3 percent of cotton fields in Hubei's 25 major cotton-producing counties were affected. Peasants throughout the province have made tremendous efforts to combat drought and save cotton seedlings. As a result, 76 percent of cotton fields in the province are insured a full stand of cotton seedlings. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 12 Jun 81 OW]

ANTIDROUGHT CONFERENCE--The Hubei Provincial Party Committee held a telephone conference on the evening of 21 June, in which it urged the people throughout the province to act immediately to combat drought, which has been going on since early April and is affecting some 18 million mu of cropland in Hubei and causing shortage of drinking water for people and livestock in some localities. Addressing the conference, Yang Zhonglin and Xia Shihou, deputy secretary and Standing Committee member of the provincial party committee, said that the provincial party committee has decided to curtail the power supply for the heavy industry and has allotted 100,000 dun of diesel oil to be used for combating drought and processing grain and edible oil. They also cautioned the people to guard against sabotaging of water facilities by bad elements and said that serious offenders must be punished. [OW231151 Wuhan Hubei Provincial Service in Mandarin 1100 GMT 21 Jun 81 OW]

COMBATING DROUGHT--People in Xiaogan Prefecture, Hubei, have been mobilized to combat drought. As there has been no substantial rainfall since 18 April, more than 700,000 mu of early rice and 500,000 mu of intermediate and late rice in the prefecture cannot be irrigated, and large tracts of cotton and other crops have also been affected. To insure sufficient supplies of power and fuel to combat drought, the prefecture has prohibited the use of diesel oil as fuel for lighting, cooking and kilning and has banned the use of tractors for transportation. It has also instructed various factories, mines and official organizations to actively curtail the use of electricity. [Wuhan Hubei Provincial Service in Mandarin 1100 GMT 22 Jun 81 OW]

XIANNING PREFECTURE DROUGHT--Rainfall in Xianning Prefecture since mid-April has dropped to as little as 26 percent of the precipitation during the same 1980 period. The drought has affected more than 1.1 million mu of the prefecture's crops. Jiayu, Puqi, Yangxin and Xianning counties have been hit hardest by the dry spell. The prefecture has sent 4,000 cadres to join 226,000 people in a day-and-night struggle against the drought. More than 13,400 diesel engines and electric motors and 2,200 water carts are used in the struggle. [OW261403 Wuhan Hubei Provincial Service in Mandarin 1100 GMT 23 Jun 81 OW]

RAPESEED PROCUREMENT--Xianning Prefecture, Hubei Province has overfulfilled the rapeseed procurement target by 37.9 percent. By 16 June, a total of 68,952 dan of rapeseed had been purchased. This was some 90,700 dan more than the amount purchased during last year's corresponding period. [OW241423 Wuhan Hubei Provincial Service in Mandarin 1100 GMT 21 Jun 81 OW]

CSO: 4007/471

BRIEFS

JIANGDU COUNTY CROPS--Jiangdu County, Jiangsu Province, has enforced a sound responsibility system in strengthening field management in rice paddies. As a result, the county's 170,000 mu of early rice and 500,000 mu of intermediate rice is growing well. [OW241441 Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 21 Jun 81 OW]

CSO: 4007/471

JILIN

BRIEFS

COMBATING DROUGHT--Beicheng and Siping prefectures and Changchun Municipality have been suffering from drought since May. Afflicted farming areas now total 5.2 million mu. Measures are being taken to combat drought. According to information released by Jilin weather stations, Baicheng Prefecture will have high temperatures during the next 10 days. The drought is worsening. [SK160614 Changchun Jilin Provincial Service in Mandarin 2200 GMT 15 Jun 81 SK]

GRAIN OUTPUT--Changchun, 18 Jun (XINHUA)--Since the introduction of the production responsibility system, Siping Prefecture, Jilin Province, has reported an increase in commercial grain output. In 1980, this prefecture delivered over 1.95 billion jin of commercial grain to the state. In 1979, only 1.72 billion jin were delivered. [OW241511 Beijing XINHUA Domestic Service in Chinese 0141 GMT 18 Jun 81 OW]

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NEI MONGGOL

BRIEFS

PRODUCTION RESPONSIBILITY--Hohhot, 7 Jun (XINHUA)--More than 20,000 agricultural production teams in Nei Monggol that formerly depended on "resold grain" and on loans and relief funds have become self-sufficient in grain supply thanks to the implementation of the production responsibility system in agriculture. Last year Nei Monggol was hit by serious natural disasters. However, as of the end of April this year only 32.4 percent of the "resold grain" was purchased in rural areas. Recently the regional party committee and the people's government held a meeting to sum up the experience in implementing the production responsibility system. The meeting urged rural cadres and masses to further emancipate their minds and eliminate the "leftist" influence. [Beijing XINHUA Domestic Service in Chinese 0049 GMT 7 Jun 81 OW]

ANTIDROUGHT FUNDS--The Nei Monggol Autonomous Regional People's Government recently convened a routine administrative meeting. It decided to allocate 3.5 million yuan for Xilin Gol, Ulanqab, Ih Ju, Bayannur and Alax leagues and Hohhot and Baotou municipalities to combat drought. The meeting noted that this money should be used for combating drought and it is prohibited to divert it to any other purpose. It called on governments at all levels to make efficient use of this money so as to achieve the greatest results. [SK191232 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 19 Jun 81 SK]

CATTLE PRODUCTION--Nei Monggol region has developed commodity cattle-producing bases in Nulun Buir and Xilin Gel leagues since 1978 and has made remarkable progress. In 1980 these bases marketed 210,000 head of cattle, an increase of 52 percent over the 1979 figures. In recent years, with the aid of state departments concerned, Nei Monggol has trained 22,000 animal husbandry technicians, accelerating the tempo of raising. [SK220337 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 21 Jun 81 SK]

CSO: 4007/471

BRIEFS

SHANDONG'S 1980 COTTON ACREAGE AND OUTPUT--According to reports from statistical departments in various areas, the area planted to cotton in 1980 in Shandong Province was 10.92 million mu, and as of 18 December 1980, the amount of ginned cotton purchased throughout the province had already exceeded 10 million dan. These purchases represented a more than three-fold increase in total output over 1979, and nearly doubled the total output of the highest year on record. Each of the 9 prefectures and municipalities, 61 counties, 990 communes and more than 32,000 production brigades throughout the province with commercial cotton tasks increased production. [Excerpt from article by the Agricultural Bureau of Shandong Province: "Shandong Reaps Bumper Cotton Harvest through Implementation of Correct Policies and Scientific Management"] [Beijing NONGYE JINGJI WENTI in Chinese No 4, 23 Apr 81 p 9] 9717

CSO: 4007/432

TIANJIN

BRIEFS

WATER SUPPLY--Tianjin is still suffering a water shortage, even following a rainfall on 20 June. Tianjin has water reserves sufficient for only 4 days. Therefore, water management should be strengthened, and consumption should be minimized. [SK230924 Tianjin City Service in Mandarin 0030 GMT 23 Jun 81 SK]

CSO: 4007/471

BRIEFS

HYBRID RICE--In 1980, Zhejiang planted 8.39 million mu of high-yielding hybrid rice. The province plans to plant over 9 million of hybrid rice this year. [Hangzhou Zhejiang Provincial Service in Mandarin 1040 GMT 18 Jun 81 OW]

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TITLE: "Preliminary Research on the Drought Resistance Physiology of Hybrid Gaoliang"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4, 20 Apr 81 pp 2-5

ABSTRACT: An experiment is carried out under tents to maintain soil moisture at 16 percent before noding time to cultivate 6 breeds of hybrid gaoliang. After node formation, the plants are not watered until serious withering occurs before one of the following treatments is applied to each group: (1) irrigate until saturation; (2) allow continuous drought; (3) irrigate the normal way (control.) Tests are carried out to determine: (1) viscosity of protoplasm; (2) elasticity of protoplasm; (3) moisture state; (4) moisture preserving ability; (5) water influence; (6) transpiration; (7) extracorporal transpiration. Results of the experiment are reported.

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TITLE: "Comments on Methods of Purifying Hybrid Gaoliang"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4, 20 Apr 81 pp 5-7

ABSTRACT: In recent years, due to mixture of parents, the quality of prepared hybrid gaoliang seeds is poor to cause yield increase heterosis to drop. This condition has greatly affected the reputation of hybrid gaoliang and its cultivated acreage. Judging from some domestic reports, Chinese scientists emphasize purification of the sterile line, to propose the method of 3-year, 3 -line purification. In view of the fact that the property of the sterile line is determined by the sterile-free line, in production the strength of heterosis is closely related to the property of the restorer line, etc. purification of hybrid gaoliang must start from the parents as well as the seed preparation process. The basic reason for the existing impurity is the biological mixture to cause the hereditary genes of the sterile line and sterile-free line to change and to produce mixed bodies having similar expressions but belonging to different genetic types. A series of fundamental processes to reverse the condition in order to purify the hybrid gaoliang breeds are suggested.

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TITLE: "On Multi-resistance Breeding of Wheat From the Viewpoint of an Analysis of the Rise and Decline of Stripe Rust Strains in Shanxi Province"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4, 20 Apr 81 pp 8-10

ABSTRACT: In nature, the wheat stripe rust pathogens (Puccinia Striiformis Westend) are composed of different types of physiological strains or types and they change with the region, the year, and the size of the acreage of the susceptible wheat cultivars. Their change is further accelerated by the uniformity of the wheat cultivar and the origin of resistance. As a result, the rust resistance of the superior breed will be lost. When the dominance of the physiological strain changes, the change implies a gradual decline and loss of rust resistance of the cultivar in production. This paper discusses the need for breeding multi-resistant breeds. A study on the technique of achieving this is reported.

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TITLE: "Research on the Soil Temperature Effect of Ground Surface Cover With Plastic Film in Cotton Fields"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4, 20 Apr 81 pp 11-13

ABSTRACT: Heat energy, expressed in accumulated temperature, is the major factor determining the function of organic life of crops. The accumulated temperature cannot be artificially controlled, however. In 1976-80, a research is carried out to raise the "ground surface accumulated temperature" by using plastic film to cover the ground surface of cotton fields. With the plastic film cover, the photosynthesis production rate of cotton seedlings is 44 percent higher than the control; during bud stage, it is 106 percent higher. The dry substance of the seedling stage (21 May) is 2.4 times of the control; during the bud stage, it is 5.59 times. Changes of soil temperature in various soil layers and their effect during the growth and development period of cotton are reported.

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TITLE: "Restoring and Developing Sesame Production"

SOURCE: Tiayuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 4, 20 Apr 81 pp 22-24

ABSTRACT: China has had a history of sesame culture of more than two thousand years. Cultivation is more concentrated in the 4 provinces of Henan, Hubei, Jiangxi, and Anhui. Sesame seeds contain about 54 percent oil, which is 17.5 percent protein. The residual cake is an excellent feed. Sesame's growth and development period is short and it is very suitable as an inter-crop or as a crop before the winter wheat. The sesame plant, moreover, is also a great source of honey. At present, there is some sesame acreage in the south and central Shanxi, but most cultivars are farm breeds, very mixed and degenerated. The yield is low. This paper examines the merits of sesame, argues for its cultivation, and discusses the technique of improving the breeds and the technique of cultivation to improve the yield.

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Phytopathology

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TITLE: "Serological Study of Rice Dwarf Virus"

SOURCE: Tianjin ZHIWU BINGLI XUEBAO [ACTA PHYTOPATHOLOGICA SINICA] in Chinese No 1, Mar 81 pp 1-6

TEXT OF ENGLISH ABSTRACT: This paper reports results of a study on the preparation of an antiserum for rice dwarf virus and serological tests on the respective antiserum. For enhancing the feasibility of the antiserum preparation, a partially purified antigen preparation for rabbit immunization was made essentially by adding polyethelene glycol (PEG, m.w. 6000, 6 percent w/v) and NaCl (3 percent w/v) to the supernatant of diseased plant sap in a phosphate buffer, and sedimenting at low speed (4000 rpm) centrifugation or at differential centrifugation. The virus-containing pellet was resuspended in a small amount of saline solution, recentrifuged, and the resulting supernatant was mixed with Freund's incomplete adjuvant. This antigenic preparation was intramuscularly injected in the rabbits.

Serological tests with antigen from infected plants have been made with gel double diffusion, hemagglutination and tube precipitin, with various degrees of success. These methods, however, have not yet been applied to an assay of vector insects.

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TITLE: "Preliminary Studies on the Host Range of Wheat Rosette Disease Caused by the Northern Cereal Mosaic Virus"

SOURCE: Tianjin ZHIWU BINGLI XUEBAO [ACTA PHYTOPATHOLOGICA SINICA] in Chinese No 1, Mar 81 pp 7-10

TEXT OF ENGLISH ABSTRACT: The present paper deals with the studies of the host range of wheat rosette disease (northern cereal mosaic virus) which is transmitted by *Laodelphas striatella*. Diagnosis was made with both electron microscopic studies and biological assays. As a result, it was demonstrated that 12 species, namely, *Eragrostis pilosa* (L) Beauv, *Eragrostis ciliarensis* (All) Link, *Eleusine indica* (L) Gaerth, *Chloria virgata* Swartz, *Avena sativa* L, *Setaria italica* (L) Beauv, *Setaria viridis* (L) Beauv, *Setaria lutesens* (Weigel) F. T. Hubb, *Hordeum vulgare* L., *Triticum aestivum* L. (Winter wheat and spring wheat), and *Sorghum*

[Continuation of ZHIWU BINGLI XUEBAO No 1, Mar 81 pp 7-10]

vulgare Pers., are hosts, while *Oryza sativa* L, *Zea nays* L, *Lolium perenne* L, *Digitaria sanguinalis* (L) Scop var. *Cillaris* (Retz) Parl. and *Gossypium hirsutum* L, usually suspected to be hosts of the virus, were demonstrated to be non-hosts. *Echinochloa crusagalli* (L) Beauv and *Poa* sp need further tests of their susceptibility to the virus.

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TITLE: "Studies of Specialized Biotypes of Cotton Fusarium Wilt Fungus in Xinjiang"

SOURCE: Tianjin ZHIWU BINGLI XUEBAO [ACTA PHYTOPATHOLOGICA SINICA] in Chinese No 1, Mar 81 pp 27-30

TEXT OF ENGLISH ABSTRACT: Differentiation of cotton fusarium wilt fungus (*Fusarium oxysporum* f. *vasinfectum*) according to the pathogenicity on the cultivars of *Gossypium badens*, *G. hirsutum* and *G. arboreum* in Xinjiang shows that two biotypes, the Tulufan form and the Shache form, are distinguished. The former infects *G. badense* only, but the latter infects both *G. hirsutum* and *G. badense*. The Tulufan form is considered to be a new specialized biotype.

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TITLE: "Identification of a Mosaic Virus Disease of Soybeans in Jiangsu"

SOURCE: Tianjin ZHIWU BINGLI XUEBAO [ACTA PHYTOPATHOLOGICA SINICA] in Chinese No 1, Mar 81 pp 31-36

TEXT OF ENGLISH ABSTRACT: An identification of a mosaic virus desease of soybeans which occurs widely in Jiangsu was carried out during 1978 and 1979. The symptoms of infected soybeans were described. Transmission through seeds was demonstrated at a high percentage. Myzus persicae, Aphis gossypii, A. glycine, A. craccivora and Rhopalosiphun pseudobrassica were able to transmit the virus experimentally, but it cannot be transmitted by Sitobion avenae.

Host range tests were made on 14 species. The virus systematically infects only the soybean and is unable to infect other species of Leguminosae and Datura stramonium, Nicotiana tabacum, N. glutinosa, Gomphrena globosa, Zinnia elegans and Chenopodium serotinum.

[Continuation of ZHIWU BINGLI XUEBAO No 1, Mar 81 pp 31-36]

The thermal inactivation point of the virus is 64∼68°C, the dilution end point is 1:2000∼10,000 and the longevity of the leaf extract is six days. An electron microscopic observation by the dip method reveals the particle of the virus as a flexuous rod measuring ± 750 x 13 nm.

According to the characteristics of symptoms, physical properties, host range, transmission and particle of the virus, we consider this virus to be a soybean mosaic virus (SMV) which belongs to the potyvirus group.

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TITLE: "Studies of the Grain Army Worm Leucania roseilinea Walker (Lepidoptera, Noctuidae) in Fujian"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 1, Mar 81 pp 17-22

TEXT OF ENGLISH ABSTRACT: The grain army worm, Leucania roseilinea Walker, is an important pest of rice in south China. In addition to rice, it also feeds to a lesser extent on some gramineal weeds. Eggs are laid either within the dry leaf sheaths or on the apex of dry leaves. The larvae usually feed on the foliage and cut down the spikelet stalk of the rice plant. According to observations made in Fuzhou and Minhou, Fujian Province, during 1962~1964, the grain army worm has six generations per year. The larvae, together with some pupae and adults, pass winter in the rice fields. There is no remarkable phenomenon of hibernation. The grain army worm causes significant injury in June-July during the second generation and serious damage in October-November during the fifth brood.

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TITLE: "Studies on Rice Dwarf Virus Disease. I. The History, Symptoms and Transmission"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 1, Mar 81 pp 27-34

TEXT OF ENGLISH ABSTRACT: The rice dwarf is one of the rice virus diseases which has been reported to prevail in the rice-growing areas of the lower-middle part of the Changjiang Valley during the 1970's, accompanying the rice transitory yellowing in general, resulting in serious losses of rice yield of the second crop. The symptoms of the disease consist of two types: one is the white spot type which shows white specks forming interrupted streaks between the veins on the diseased leaves, and the other is twisted-incised leaf type in which the newly emerging leaf or leaf apex becomes spirally twisted or the leaf margin becomes incised. The disease is transmitted by Nephotettix cincticeps, N. nigropictus and Recilia dorsalis. The shortest acquisition feeding period for N. cincticeps is

[Continuation of ZHIWU BAOHU XUEBAO No 1, Mar 81 pp 27-34]

5 minutes, and the incubation period of the virus in the vector ranges from 12.4 days at 29.2°C to 17.0 days at 20°C. Most infective insects transmit the virus continuously until death. The proportion of congenitally infective insects is as high as 74.4-88.5 percent. From six to eight days at about three to four instar must elapse before most of the nymphs from transovarial passage become infective, although a few individuals may transmit the virus immediately after they emerge from eggs. The proportion of active transmitters differs with the location where the insects are distributed.

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TITLE: "On the Environmental Factors Affecting Infection and Cultural Measures of Controlling Corn Head Smut (Sphacelotheca reiliana (Kuhn) Clint.)"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 1, Mar 81 pp 41-46

TEXT OF ENGLISH ABSTRACT: Corn seedlings were infected by head smut (Sphacelotheca reiliana (Kuhn) Clint.) at soil temperatures of from 10 to 35°C. Temperatures ranging from 20 to 30°C were highly favorable for infection (optimum at 25°C) in Jilin Province. Early or late sowing reduced the incidence of corn head smut.

The teliospores in soil retained their viability for at least three years. Soil microorganisms influenced the survival of teliospores. The exudate of plant roots or buds stimulated teliospores germination. The germinated spores lost viability if they failed to find the host plants. Infection percentage varies with the logarithm of the population of viable teliospores in the soil. Cutting and eliminating smutted plants and rotation with other crops other than corn for at least three years would control this disease.

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TITLE: "On the Control of *Rhizoctonia solani* Kuhn and *Colletotrichum gossypii* Souch of Cotton Seedlings with New Systemic Fungicide Banzhongling"

SOURCE: Tianjin ZHIWU BAOHU XUEBAO [ACTA PHYTOPHYLACTICA SINICA] in Chinese No 1, Mar 81 pp 59-66

TEXT OF ENGLISH ABSTRACT: The present article deals with the control effect of a new systemic fungicide, Banzhongling (2-amino-4-methyl-5-carboxanilidothiazole), and its pesticidal complex Banzhongshouang (Banzhangjing + TMTD) against *Rhizoctonia silani* and *Colletotrichum gossypii* diseases of cotton seedlings. Results obtained from the laboratory and field trials proved that the control effect of Banzhongling against *R. solani* was nearly the same as or somewhat better than Wusaiheji (pentachloronitro benzene + Seresan) and Daojiaoqing (methyl arsonic acid zinc salt). As for Banzhongshouang, its effect against *R. solani* is as good as that of Banzhongling and, against *C. gossypii*, similar to that of Wusaiheji, but a little less than that of Daojiaoqing. The germination percentage of cotton seeds treated with Banzhongling or Banzhongshouang is quite close to the untreated check and shows a normal growth in the cotton field later.

[Continuation of ZHIWU BAOHU XUEBAO No 1, Mar 81 pp 59-66]

The authors suggest that Banzhongling and Banzhongshouang be applied in the cotton plant district which is naturally infested with *R. solani* seedling disease, and that Banzhongshouang also be used when the prevalent cotton seedling pathogen is *C. gossypii*.

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